

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: GROLLITSCH, Helmut, et al

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TITLE: METHOD AND APPARATUS FOR DETECTING A CRACKED OR BROKEN CASE

Amendment E: CLAIM AMENDMENTS

Claims 1-38 (canceled).

39. (Currently amended) An apparatus for detecting a cracked or broken case comprising:

a frame;

a conveyor means mounted on said frame, said conveyor means for moving the case

along said frame;

a first ram means affixed to said frame, said first ram means for applying a force onto a surface of a wall of the case;

a second ram means affixed to said frame and positioned in a different location on said frame from said first ram means, said second ram means for applying a force onto another surface of the case, said second ram means comprising a pneumatic ram having a cylinder affixed to said frame and a piston extending outwardly of said cylinder, said piston being movable between a first position and a second position relative to said cylinder, said first position positioning said piston away from said another surface of the case, said second position urging against said another surface of the case, said piston having a curved surface positioned at an end of said piston opposite said cylinder;

a sensor means cooperative with said ram means, said sensor means for detecting

when the surface of the wall of the case has deflected beyond a desired amount; and

an ejection means affixed to said frame and cooperative with said sensor means for ejecting the case directly from said conveyor means when the wall of the case has deflected beyond the desired amount, said ejection means comprising:

a ram having a cylinder affixed to said frame, said pneumatic ram having a piston extending outwardly therefrom, said piston being movable between a first position and a second position relative to said cylinder, said first position causing said piston to be positioned away from the case on said conveyor means, said second position urging against the case on said conveyor means so as to separate the case from said conveyor means, said piston of said pneumatic ram having a roller rotatably positioned at an end of the piston opposite said cylinder.

40. (Previously presented) The apparatus of Claim 39, said first ram means comprising:

a pneumatic ram having a cylinder affixed to said frame, said pneumatic ram having a piston extending outwardly therefrom; and

an arm pivotally connected to said piston and pivotally connected to said frame.

41. (Previously presented) The apparatus of Claim 40, said piston being movable between a first position and a second position relative to said cylinder, said first position causing said arm to be positioned away from the wall of the case, said second position urging the wall of the case outwardly.

42. (Previously presented) The apparatus of Claim 41, further comprising:

a sensor means connected to said cylinder and cooperative with said piston, said sensor means for determining when said second position is beyond a desired limit of movement.

43. (Canceled).

44. (Previously presented) The apparatus of Claim 39, further comprising:

a positioning means affixed to said frame, said positioning means for fixing a position of the case relative to said frame.

45. (Previously presented) The apparatus of Claim 44, further comprising:

a separating means affixed to said frame in spaced relation to said positioning means, said separating means for spacing another case from the case on the conveyor means when said positioning means fixed the position of the case.

46. (Currently amended) A method of detecting a cracked or broken case comprising:

forming a frame having a conveyor thereon;

placing a plurality of cases on said conveyor, each of said plurality of cases having an open side and a closed side with a plurality of walls extending therebetween and being placed on said conveyor such that an open side thereof faces said conveyor;

moving said plurality of cases in a direction on said conveyor;

fixing a position of one of said plurality of cases on said conveyor;

applying a force against one of said plurality of walls such that the wall deflects;

determining whether the deflection is beyond a desired amount; and

ejecting the case directly from said conveyor when the deflection of the wall is beyond the desired amount by use of a pneumatic ram having a cylinder affixed to said frame, said pneumatic ram having a piston extending outwardly therefrom, said piston being movable between a first position and a second position relative to said cylinder, said first position causing said piston to be positioned away from the case, said second position urging against the case so as to separate the case from said conveyor.

47. (Previously presented) The method of Claim 46, said step of applying the force comprising:

positioning a surface of a ram against the wall of the case; and

actuating said ram such that said surface of said ram urges against the wall of the case.

48. (Previously presented) The method of Claim 47, said step of determining comprising:

sensing an amount of movement of said surface of said ram.

49. (Previously presented) The method of Claim 48, said ram having a pneumatic cylinder mounted in a fixed position, said ram having a piston extending outwardly of said cylinder, said ram having an arm pivotally connected to said piston, said step of actuating the ram comprising:

retracting said piston within said cylinder such that said arm pivots outwardly, said arm having said surface thereon urging against the wall.

50. (Previously presented) The method of Claim 46, said step of fixing the position comprising:

actuating a pneumatic ram such that a piston of the ram extends through said open side and abuts one of said plurality of walls so as to stop a movement of the case relative to said conveyor.

51. (Previously presented) The method of Claim 46, further comprising:

applying another force against said closed side of said case, such that said closed side deflects; and

determining whether the deflection of said closed side is beyond a predetermined limit.